Michigan Enterprise Architecture Work Plan Guidelines

Table of Contents

Overview and Highlights

Overview of Guideline Materials

The following materials represent guidelines and the work plan for the refinement and maturation of Michigan's enterprise architecture. Michigan will have an enterprise Architecture Plan developed in 2006, formalizing the current enterprise architecture practices, and addressing performance, business, technology, data and information services as well as related management components. Specifically, the plan will address enterprise business architecture (EBA), enterprise information architecture (EIA), enterprise technology architecture (ETA), and assess the potential and requirements for a service oriented Architecture (SOA).

A particular emphasis will be placed on cross-boundary information and service sharing and interoperability, as well as transformation of government. The Enterprise Architecture Plan will be integrated with the Michigan Cabinet Action, Michigan IT Strategic, and Agency Services plans.

The development of an Enterprise Architecture (EA) Plan is one of the 2006 Michigan IT Strategic Plan foundations along with Cyber Security, Finance and Human Services, IT Procurement and Statewide Communications. These provide the necessary foundation to both improved state operations as well as the new and innovative Michigan enterprise approaches to IT such as the 7 enterprise solutions.

The Michigan EA Plan will support several state goals and strategies, including the Cabinet Action Plan goal of "Better Government" and the IT Strategic Plan goal three "Manage Technology and Provide Better Service and Faster Delivery". Specifically, the EA Plan supports the strategy to "implement consistent and supportable architecture and standards". This is a repeatable process that includes on-going refinement.

EA Plan Guideline Highlights

The guideline materials consist of three EA components, (1) a description of the EA process, (2) an EA framework and, (3) the Michigan EA work plan elements.

- **EA Process:** A description of the process model, eight process activities and coordination and integration requirements. The materials are based upon and in part excerpted from the Gartner EA Process Model, particularly "Gartner Enterprise Architecture Process: Evolution 2005".
- **EA Architecture Framework:** Description of framework considerations and requirements, enterprise architecture viewpoints (Business, technology, information and services), enterprise solution approach and requirements, and governing, managing and accountability. The materials are based upon and in part excerpted from "Gartner Enterprise Architecture Framework: Evolution 2005", "Architecture Frameworks: Some Options", and "NASCIO EA Development Tool Kit", Version 3.0.
- **EA Work Plan:** Architecture management best practice guidelines and activities.
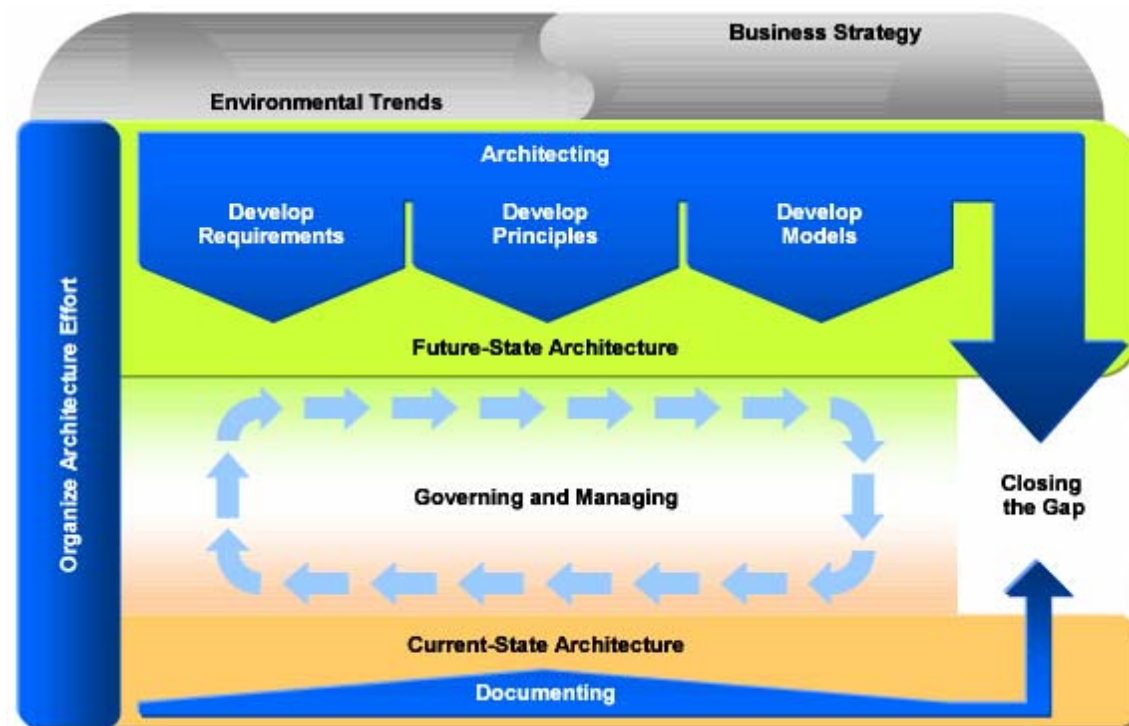
EA Process

According to Gartner, successful EA programs are process-focused. EA is a process discipline. Done well, it becomes an institutionalized part of how an organization makes decisions to direct its investments, such that the chosen business strategy will be realized. The EA process bridges the gap that otherwise exists between business strategy and technology implementation.

The Michigan EA Plan development process will follow these principles, starting with a process orientation and a solid grounding in the business strategies of the state government. The following section describes some of the process steps that will be used in refining and maturing the Michigan Enterprise Architecture.

Process Model

The following graphic (Figure 1) describes the Gartner EA Process Model being used by the State of Michigan as guiding principles.

Figure 1: Gartner EA Process Model

Process Guidelines and Activities

Environmental Trends

Business architecture needs to start with an environmental context. That is, a contextual understanding of what is going on economically, politically, and in the way of citizen expectations. This includes identification and understanding of the trends, changes, market forces, fiscal and monetary policies and their immediate and latent effects on the economy, availability of capital, and labor. It is important to realize that information technology is not only a tool for government, but also a driver for transforming the operations of government. The Michigan IT Baseline, Opportunity and Gap Analysis currently under review represent a beginning step in this process.

Business Strategy

The EA must support and reflect the business drivers and strategies of the enterprise. For Michigan this means the Cabinet Action, Michigan IT Strategic and Agency Services plans. One of the important points to note is that EA, while dependent on business strategy, is also an enabler of business strategy as it evolves into a more mature process and set of deliverables. EA enables business strategy by providing a set of models that depict the state of business, information and technology architecture in the enterprise, making it easier to conduct impact and scenario analysis.

Organizing the Architecture Effort

A properly resourced and well-run EA program is essential to achieving and communicating the promised benefits. The architecture effort must be properly scoped, resourced and executed, and its goals and accomplishments must be communicated effectively. This phase in the process may appear to be a one-time effort at the beginning of an EA program. While this is certainly required at the beginning of an EA program, at least part of the phase must be repeated under some conditions. The EA process must be performed in iterative fashion.
Sections II. C on "Process Integration" and IV on the "Work Plan" address these requirements.

Future State Architecture

Architecting the future state of EA is the heart of the entire process. The goal is to translate business strategy into a set of prescriptive guidance to be used by the organization (business and IT) in projects that implement change. Future-state architecture produces the following classes of work products:

- Requirements — Express the needs of the enterprise
- Principles — Provide high-level guidance for decision making
- Models — Illustrate future-state architecture in greater detail to guide more-detailed decision making

As a general rule, future-state architecture is developed before the current-state architecture for given EA viewpoints or areas within viewpoints (although there are exceptions to this rule).

Current State Architecture

Understanding and documenting current-state architecture is necessary to proceed with plans to close the gap between current and future states. The purposes for documenting current-state architecture are to:

- Provide an initial baseline to compare against the future state
- Help identify dysfunctions, duplications, complexity and dependency
- Facilitate continual updating of infrastructure documentation
- Serve as reference material

Scoping the current-state documentation based on future-state architecture helps answer the following questions about applications, infrastructure and standards:

- Do they support future-state IT requirements?
- Are they consistent with the enterprise position on technology/technology market trends?
- Are they aligned with the design principles?
- Identify technology requirements that are not met by technical infrastructure. These are the gaps.

Analysis and Closing the Gap

Gap analysis is the step of the EA process that seeks to identify differences between current-state and future-state specifications from the EA deliverables. The following key inputs are required (although not exclusively) to effectively identify, analyze and propose recommendations:

- Business solution requirements from the common requirements vision
- Conceptual architecture principles
- Future-state specifications
- Future-state architecture models and artifacts
- Documentation of the current-state architecture

The gap analysis phase specifies the following steps to use the inputs:

- Identify and classify gaps (cultural, structural and functional) — in this step, differences between current-state and target architecture are identified and classified accordingly.
- Analyze gaps — Different tools are used to understand the difference between the current state and the target.
- Develop recommendations — Actions are proposed to close the gaps. Different scenarios may be considered to close these gaps.
- Prioritize recommendations — Illustrations of interdependencies and priorities are completed to fulfill the recommendations to close the gaps from the scenario list, as warranted.

Governing and Managing

Governing refers to the processes and organizational structure, along with their associated input and decision rights, that guide desirable enterprise behavior. Managing refers to the discipline of creating and maintaining EA artifacts. Some of the requirements for this part of the process are discussed under II. D "Governing, Managing and Accountability."

Process Integration

EA is a proactive analytical process that supports strategic alignment, information gathering, governance, direction and control; plus, it facilitates intra-organizational communication, cooperation and sustained strategy realization. EA should not happen in isolation. To be effective, it must link IT planning, management and oversight as well as solution development. Some of the elements to be integrated include:

- **Strategizing and Planning:** Identify the business strategy, create or refine an IT strategy, evolve the architecture process
- **Architecting:** Develop the to-be architecture, document the current architecture, identifying gaps, develop a road map
- **Governance:** Link to portfolio management, investment management, life cycle management and related processes
- **Leadership:** Educate, mentor, train and develop staff
- **Communications:** identify stakeholders, develop the value proposition, evangelize

Figure 2, the "Gartner EA Activity Map," identifies and describes some of the activities that must be coordinated and integrated. The work plan guidelines cited in Section IV include the development of provisions that ensures this coordination and integration.
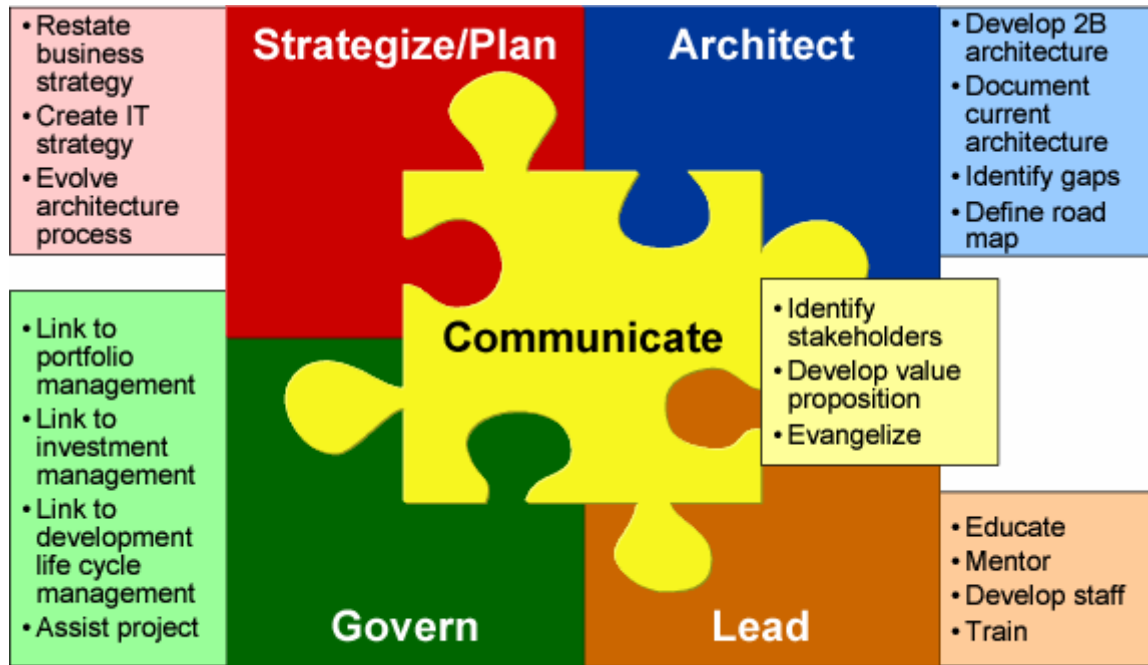
Figure 2: Gartner EA Activity Map

Michigan Enterprise Architecture Framework

Framework Requirements

The ***Enterprise Architecture Framework*** refers to the overarching structure that addresses all of the elements of the Enterprise Architecture. Additionally, it defines the interrelationships between these elements in a consistent and organized fashion. Many different architecture frameworks are available today (e.g. Open Group Architecture Framework and Zachman), but no single framework necessarily meets all of the EA initiative needs. However, there are some common criteria that are useful in selecting suitable aspects from frameworks. These are also the principles that Michigan has used in borrowing features from the Gartner, NASCIO and other frameworks. The framework should:

- Be readily understandable and helpful as a communications tool
- Be consistent and structured
- Should make a "top down" approach simple and natural
- Incorporate a variety of constructs at multiple levels of abstraction
- Define a process for developing the architecture
- Describe the artifacts that will be produced

Additional advantage is obtained if the framework also includes guidelines for embedding the architecture in the planning and development processes of the organization. Guidelines on possible governance processes and structures can also be useful, as can suggestions for communicating the contribution made by the architecture.

Enterprise Architecture Viewpoints

Excluding the Enterprise Solution Architecture Framework (ESAF), which is a "architecture of architectures", both the Gartner and NASCIO frameworks describe three primary viewpoints: enterprise business architecture (EBA), enterprise information architecture   (EIA) and enterprise technology architecture (ETA). Each viewpoint represents the concerns central to a specific set of stakeholders. EBA represents the process and organizational concerns of business architects, the EIA represents the information flow and information modeling concerns of information architects, and the ETA represents the technical implementation and operational concerns of technical architects.

Additional viewpoints may be "extracted" and called out explicitly if there is a requirement from specific stakeholders to do so. For example, currently there is a wide ranging discourse on the requirements and benefits of Service Oriented Architecture (SOA). The Michigan EA work plan calls for refining and maturing the first three viewpoints and assessing SOA potential.

Business Architecture

Description:
Business Architecture provides the high-level representation of the business strategies, intentions, functions, processes, information and assets critical to providing services to citizens, businesses, governments and the like. The Business Architecture Framework provides the structure for the collection of detail regarding the motivations, organization, location, events, functions and assets that define the direction of the enterprise from the business perspective. The detail captured within the Business Architecture supports business decision-making by providing documentation of where the enterprise is today and where the enterprise wants to be at a specified time in the future.

Business Architecture can be viewed as the foundation or driver for the other components of an Enterprise Architecture. For enterprise architecture to be successful, it must be linked to the business direction of the enterprise. Business architecture must also consider interaction with other governments, as well as delivery of services to citizens of other governments. Business Architecture includes this aspect as business interactions.

Selected Michigan Activities and Building Blocks
- Integration of the Michigan IT Strategic Plan with the Cabinet Action Plan, now in the second year
- Development of the first Agency Services Plan
- Availability of the Government Performance Project assessment and documentation information base on Michigan business and management practices, in a comparative national context

Technology Architecture

Definition / Description:
Technology Architecture is a disciplined approach to describing the current and future structure and inter-relationships of the enterprise's technologies in order to maximize value in those technologies. The Technology Architecture Framework provides a sound set of structured processes and templates to support implementation and communication of the Technology Architecture. The mapping of the technology products and standards to the Business Drivers is vital to align the overall enterprise direction. Vendors, employees, and business users can benefit from an understanding what technology standards exist and where these standards can be found.

Technology Architecture provides a framework, based on business needs that are aligned with technology, for developing technology solutions that operate across agencies and align with the business needs of state and local governments.

Selected Michigan Activities and Building Blocks:
- Strong enterprise perspective and coordinative, shared service authority for MDIT, with a strong history of coordinated and consolidate technology assets
- Established, strongly developed technology architecture and standards

- Expanded planning horizon and proactive assessment of technology options through the Horizon program
- Seven enterprise solution initiative: Mobile worker, data sharing and integration, enterprise contact center, citizen self-service transactions, collaborative tools, shared administrative services, infrastructure coordination and integration

Information Architecture

Description:
Information Architecture is the compilation of the business requirements of the enterprise, the information, process entities and integration that drive the business and rules for selecting, building and maintaining that information. Information Architecture addresses the informational needs of the enterprise. The information architecture aligns business processes to information systems that support these processes. Using the set of business processes that provides a view of the functions of the enterprise, the Information Architecture will give the organization a high level representation of its critical data. It also promotes information sharing and exchanges across agencies and boundaries.

The detail captured within the Information Architecture clarifies business relationships and enhances understanding of the business rules the enterprise has adopted. This understanding forms a baseline for exploring and implementing changes in how business is done, and what business rules the enterprise will adopt.

Selected Michigan Activities and Building Blocks:
- Data sharing and integration initiative component of the seven enterprise solutions
  - Data Warehouse Framework
  - K – 20 Tracking System
  - Fusion Intelligence Center
  - Other
- Selected cross-boundary initiatives
  - Health Information Network
  - E-Procurement
  - Local government portal development, coordination
  - Other
- Michigan.gov portal refinement
- Emphasis on the role of information in the Infusion Strategies

Service Oriented Architecture

Among the most powerful changes driving the future of architecture are the demands for improved business and service performance, including overcoming the disadvantages and shortcomings of IT that have hindered its potential. A popular IT term currently is "service-oriented architecture" because it promises to make a breakthrough in the ability to develop applications quickly, and to enable those applications to be agile. The term "SOA" is being widely adopted and used in many ways by both users and vendors, yet it is centered on architecture, which is central to its potential.

SOA appeals to organizations because of the image of creating an application by merely assembling a series of pre-defined component services to perform the task at hand. It is particularly appealing when the components are not typical software functions, but rather, individual business tasks or services — thus tailoring the process to the direct needs of the business — also known as a service-oriented business application (SOBA). SOA promises capabilities for rapid development and quick updates to applications in response to business needs, thus overcoming the complaint that IT inhibits the business (**Source:** "The Future of Enterprise Architecture: Major Demands Ahead ", Gartner, December 8, 2005). The Michigan EA Plan will include an assessment of SOA potential and requirements.

Enterprise Solution Architecture Framework

Solution Architecture is a process within the Enterprise Architecture that focuses on the development and implementation of a solution or service being created for the enterprise.
The Solution Architecture framework is a combination of structured processes and templates that utilize existing architecture documents (such as business, information, and technology components as well as models and patterns) to design a desired business solution. The Solution Architecture framework, by allowing the development of a Solution Set, facilitates the rapid development and delivery of a solution in a systematic and well-disciplined manner.

The ESAF deals directly with arguably the single most important and challenging architectural issue: combining and reconciling the loosely coupled and often conflicting viewpoints of the primary stakeholders into a unified architecture for an enterprise solution that actually solves a business problem without creating other, even larger, problems. It is the "architecture of the architectures".

Governing, Managing and Accountability

EA is and must be treated as a program. Projects have defined start and end dates, and are measured on the effectiveness of a specific implementation (e.g. deliverable effectiveness, on-time delivery, delivery within budget, etc.) EA is an ongoing effort. Once developed, the architecture is kept vital through on-going reviews and updates, allowing the organization to prepare technology plans based on business and technology drivers.

Using program management principles to administer EA assures:
- Creation of a viable EA Framework (structural elements such as Architecture Governance, lifecycle processes, integration with procurement, communications, IT strategic planning and other core management activities)
- Documentation of architecture blueprints (content) that provides value to decision-making authorities
- Design of enterprise solutions that leverage existing assets, knowledge, configurations and infrastructure
- Evolution of the program through continuous improvement and refinement of the EA program and content.

- Establishment of sound performance provisions such as the federal Performance Reference Model (PRM)

Architecture Governance addresses the governance roles and processes required for maintaining Enterprise Architecture. The Architecture Governance Framework is used to create a sound governance model to support implementation and management of the architecture as necessary to ensure the enterprise achieves its objectives. The architecture governance framework must be resilient enough to allow for those in primary governance roles to learn and adapt, manage the risks, and appropriately recognize opportunities and act upon them.

Work Plan: Architecture Management Best Practice Guidelines and Activities

The following work plan guidelines and activities are based on Gartner and Forrester research and advisory services best practices, NASCIO guidelines, the FEA PMO 2005 Action Plan and selected state management practices. These will be incorporated in a formal work plan and integrated with the EA process activities described in Section II. The Michigan Enterprise Architecture Plan is to be developed by the end of CY 2006.

- **Value Proposition:** Refine the Michigan EA Value Proposition to agencies and the cross-boundary IT community.
- **Change Management:** Establish a change management process and calendar.
- **Communications Strategy:** Develop and implement an initial communications strategy and plan, communicating the role of EA and setting expectations of individuals participating in the process.
- **Stakeholders and Governance Provisions:** Identify the full range of stakeholders, including potential cross-boundary partners and refine governance provisions. Establish a plan for setting up a governance mechanism.
- **EA Leadership:** Identifying the EA leader or chief architect.
- **EA Team:** Build and charter the "EA team," which will own and facilitate the EA process and establishing clear roles and responsibilities.
- **Align EA with Core Planning and Management Processes and Priority Projects:** Align EA with Strategic Planning, project and portfolio management, procurement, other core management processes and priority projects.
- **Performance and Accountability:** Align with the CAP, IT Strategic and Agency Services Plan goals and strategies and link to the associated performance and accountability provisions. Define EA related measures of success to articulate value delivered.

The guidelines are based upon and in part excerpted from best practice process and framework as well as planning materials developed by the Gartner and Forrester research and advisory services, NASCIO and other government entities such as the U.S. Office of Management and Budget, as well as other states. Major sources utilized in developing these guidelines include:

- "The Future of Enterprise Architecture: Major Demands Ahead", (Gartner, December 8, 2005)
- "Gartner's Enterprise Architecture Process and Framework Help Meet 21st Century Challenges", (November 8, 2005) and associated briefs, which represent a synthesis of Gartner and META approaches. The materials utilized from this series include:
    - "Gartner Enterprise Architecture Process: Evolution 2005", (October 21, 2005)
    - "Gartner Enterprise Architecture Framework: Evolution 2005", (October 25, 2005)
    - Enterprise Architecture Improves IT Planning Synergies", (October 31, 2005)
- Architecture Frameworks: Some Options", (Gartner, November 22, 2004)
- Architecture Frameworks: How to Choose", (Gartner, November 19, 2004)
- "NASCIO EA Development Tool Kit", Version 3.0, October 2004
- "Enabling Citizen - Centered Electronic Government: 2005 – 2006 FEA PMO Action Plan", (OMB, March 2005)
- "FYO7 Budget Formulation: FEA Consolidated Reference Model Document", (OMB, May 2005)